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may be mentioned at least one species of leaf-cutting ant whose peculiarly spiny body presents an interesting appearance, though it is in no way of special importance to the Indians. One very large, black, stinging ant, called cunga in Spanish, and nyū'mi in Cayapa, is much feared by the Indians and others resident in this region, for the reason that its sting produces not only an annoying local irritation, but also a rise in the temperature of one bitten, so that it is commonly said that the sting of the cunga insures two days of fever.

Certain species of small bees are of value to the Indians, particularly in the production of the wax used in calking canoes and pottery, and in painting canoes; it is also employed remedially to a slight extent as a cure for cuts and abrasions. The honey made by these bees is very little sought as a food, and is quite secondary in value to their wax. The Indians recognize four classes of these bees. The pulsa ta'nda is a small black species that lives in trees and makes the best wax which is yellow in color and is produced in larger quantities than that made by any of the other bees. The cifemi'shi, also a small black bee, lives in the ground and produces an inferior black wax which is used only to a limited extent by the Indians. The third of these small black bees is the ta'ndz, which lives in trees but which produces much more honey than wax. The fourth species, anshi a'ma, is a small yellow bee which likewise lives in trees and produces a black wax that is used to a considerable extent.

Certain insects are employed as food. Two of these,

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fresh from the rollers, as well as after boiling, in fact at any stage before it begins to ferment, the juice is called pi' wapû, literally "water guarapo," in contradistinction to the fermented juice, which is called sa'wapû, meaning "sour guarapo." The ollas referred to are especially made for the purpose, and are the most difficult work of the potter, as their size renders them not only inconvenient to form and handle while drying, but makes them also extremely hard to fire. They are almost invariably coated inside and out with leva (Cayapa, amû'ya), the wax of a small bee, which renders them impervious and prevents waste through seepage. The bases of these large vessels are comparatively small, therefore to prevent them from tipping, each is set upon a ring made of refuse cane. When sugar-cane was first introduced among the Cayapa, rum was not made, but the fermented guarapo was much drunk, and even at the present time considerable quantities are so used. To be sure, it is by no means so intoxicating as rum itself, but after it has fermented for two to three weeks it contains a considerable proportion of alcohol. The fermented guarapo is drunk not only about the home and during the process of distillation, but also to a certain extent at fiestas, to which it is brought in large ollas and consumed in place of rum and by some in preference to it.

The guarapo is finally distilled in order to produce the concentrated alcoholic beverage known by the Spanish name aguardiente and called by the Cayapa i'ckala. The still used in this final process is illustrated in pl. LXIII, from a photograph made while the distillation was in

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planting. They are, however, all eaten raw and to a limited extent by the Cayapa whenever obtainable. 245 262

Hunting

In the Cayapa region, where game of various sorts is so abundant, hunting is a practice of considerable importance. This is now done almost entirely with old-fashioned muzzle-loading shotguns, which have supplanted blow-guns almost entirely. In aboriginal times the blow-gun was the chief weapon employed in hunting, and a few of them are still in use, especially by the boys in hunting small birds. In addition to the blow-gun the Cayapa say that they formerly had lances made entirely of the wood of certain hard palms, and that more recently they used the bow and arrow. They maintain that they originally did not know the use of the bow and arrow, but that they became acquainted with these only after coming down from the high mountains to the vicinity of their present abode, which was then occupied by another people. The bow and arrow appear to have been comparatively little used at any time by the Cayapa, but formerly the lance was much used in hunting wild hogs and one or two other species of game. In fact it is still used by some in hunting the guanta, a species of large rodent which lives in burrows. 224 411 [177] [177]

The blow-gun, called by the Cayapa pitcū'ə, is a slender tube varying from about six to nine feet in length, made of palm-wood wrapped with pitigua and the whole covered with brea, the black waterproof wax used especially for calking canoes. The blow-gun tapers [237]

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in his craftsmanship. The less particular artisan simply paints rude designs with a small coconut-bark brush.

The designs, called kū'm bīlya, used upon canoes are varied. They are largely geometric, consisting chiefly of dots, lines, and triangles, although sometimes animal figures are employed. These last, however, appear only on those canoes made by the Cayapa for sale. On pl. LXXII-LXXV are shown most of the designs used by the Cayapa on canoes made for their own use. They bear no special symbolic significance, none of them is typical of any special group of people, and no individual ownership is connected with any of them. In large measure they bear no names other than the generic kū'm bīlya, literally "canoe design."

As before mentioned, brea is the wax made by certain small bees common to the region. It is called amû'ya, and is of two kinds, black and yellow, the latter being much preferred. The particular bees which produce the brea are of four different species. A small black bee, which lives in hollow trees and is called paba ta'nda, makes the wax of the best quality and in greater quantities than any of the others. Another small black species, called ta'nda also, lives likewise in hollow trees and makes much more honey than wax, but a certain amount of its wax is used. A third species is called ciñemi'skī; it is also black, but builds its nest in the ground and its wax is used to a limited extent. The fourth species is a small yellow bee called amûī a'ma; its wax is black.

Brea is obtained by smoking out the bees and chopping

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237 222 open the log or chopping down the tree. None of these species of bees makes honey of any particular value, hence they are sought almost exclusively for the wax. The bees are very vicious, and therefore a certain amount of danger attends the process of obtaining the brea. In smoking out the bees, ordinarily a wide strip of green bark, about three feet long, or the large blossom bract of a large species of palm, is used as a case in

FIG. 12.—Device for smoking out bees

which to place the green or wet wood and coals used to make the smudge. Near its ends this bundle is securely bound by two pieces of pitigua which project enough to make loops about fifteen inches in length, by which the apparatus may be carried about. When completed, this smudging device (fig. 12) is about ten or twelve inches in diameter and three feet in length. It is taken by a man, who has wound about his head and the other exposed parts of his body handkerchiefs or other pieces of

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cloth, and is placed near the opening at which the bees enter and leave the tree or log. The smudge apparatus is then fanned until a volume of smoke is produced, which in time drives away or stupefies the bees and makes possible the taking of the brea. The wax is found in large blocks, usually at the bottom of the nest, and is cut out with an ax or a machete. It keeps indefinitely, and is stored either in the house or is buried in the ground until needed.

Shortly before or sometimes just after painting the canoe with brea, a hole is cut in the middle of the prow at a point just back of the slightly raised transverse line upon its upper surface, for the cable by which the canoe is moored. This cable, called kondō'pi, consists usually of from two to four strands of carefully selected pitigua twisted together. Such a cable of three strands is shown in pl. xcr, 1. The length of the cable usually varies according to its diameter and the number of its strands, governed by the size of the canoe for which it is made. For very small canoes, frequently a single strand of pitigua is sufficient, but in most cases a two-strand cable is required; very large canoes have three-strand and sometimes even four-strand cables. In making a cable it is necessary first to twist each of the pitigua strands separately, the bark of the strands first having been removed. By means of this twisting the strand is rendered pliable, as well as stronger, since the fibers, which ordinarily would be parallel, are forced to twist around one another. The twisted strand is now wound round a hooked stick, such as that used in cleaning the